P
Tech
B

THIS SPECIFICATION IS SENT OUT WITH THE COMPLIMENTS OF A JOINT COMMITTEE OF THE BRASS, COPPER AND NICKEL SILVER INDUSTRIES IN THE UNITED KINGDOM.

No. 3000—1921
FORMERLY
No. 145—1921.

British Standards Institution
Repr

British Engineering Standards Association.

Incorporated by Royal Charter 1929.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE
BY
THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

BRITISH
STANDARD SPECIFICATION
FOR
CONDENSER TUBES
AND
SCREWED GLANDS FOR CONDENSERS
FOR
MARINE PURPOSES.

LIBRARY
JUN 19 1933
UNIVERSITY OF TORONTO

LONDON:
PUBLISHED FOR THE ASSOCIATION BY CROSBY LOCKWOOD & SON,
7, STATIONERS' HALL COURT, LUDGATE HILL, LONDON, E.C.4;
AND TO BE PURCHASED FROM ANY BOOKSELLER, OR DIRECT FROM THE OFFICES OF THE
BRITISH ENGINEERING STANDARDS ASSOCIATION,
28, VICTORIA STREET, LONDON, S.W. 1.

October, 1921.

COPYRIGHT.
ALL RIGHTS RESERVED, INCLUDING RIGHTS OF TRANSLATION.

Price 2/- Net. Post Free 2/2.

This Specification was adopted by the Sectional Committee on Details in the Construction of Ships and their Machinery on the 14*th September*, 1921, *and approved on behalf of the Main Committee on* 14*th September*, 1921.

NOTE.

In order to keep abreast of progress in the Industries concerned, the British Standard Specifications are subjected to periodical review.

Suggestions for improvements, addressed to the Director, British Engineering Standards Association, 28, *Victoria Street, London, S.W.* 1. *will be welcomed at all times. They will be recorded, and in due course brought to the notice of the Committees charged with the revision of the Specifications to which they refer.*

December, 1932.

C.C. 8760.

Further copies, if required, may be obtained from the Canadian Engineering Standards Association. Any Consumer suggesting a modification of this Specification to meet special or local requirements is requested to make his wishes known to C.E.S.A., 79, Sussex Street, Ottawa, Ont.

No. 3000—1921
FORMERLY
No. 145—1921.

British Engineering Standards Association.

Incorporated by Royal Charter 1929.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE
BY
THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

BRITISH
STANDARD SPECIFICATION
FOR
CONDENSER TUBES
AND
SCREWED GLANDS FOR CONDENSERS
FOR
MARINE PURPOSES.

LONDON:
PUBLISHED FOR THE ASSOCIATION BY CROSBY LOCKWOOD & SON.
7, STATIONERS' HALL COURT, LUDGATE HILL, LONDON, E.C.4;
AND TO BE PURCHASED FROM ANY BOOKSELLER, OR DIRECT FROM THE OFFICES OF THE
BRITISH ENGINEERING STANDARDS ASSOCIATION.
28, VICTORIA STREET, LONDON, S.W. 1.

October, 1921.

COPYRIGHT.
ALL RIGHTS RESERVED, INCLUDING RIGHTS OF TRANSLATION.

Price 2/- Net. Post Free 2/2.

No. 3000—1921
formerly
No. 145—1921.

CONTENTS.

TABLE OF CLAUSES.

		PAGE
1	Quality of Material	3
2	Manufacture	3
3.	Dimensions of Condenser Tubes and Tubes for Screwed Glands	3
4.	Dimensions of Screwed Glands	4
5.	Weight of Condenser Tubes	4
6.	Hydraulic Test for Condenser Tubes	4
7.	Mechanical Tests for Condenser Tubes and Tubes for Screwed Glands	4
8.	Inspection	4
9.	Testing Facilities	5

APPENDIX.

Approximate Metric Equivalents		7

Note.—*The Association desires to call attention to the fact that this Specification is intended to include the technical provisions necessary for the supply of the articles herein referred to, but does not purport to comprise all the necessary provisions of a Contract.*

BRITISH STANDARD SPECIFICATION FOR CONDENSER TUBES AND SCREWED GLANDS FOR CONDENSERS FOR MARINE PURPOSES.

Quality of Material.

1. The material of the shells from which the tubes for Condensers and for Screwed Glands are drawn shall be an alloy of Copper and Zinc as follows:—

For Condenser Tubes:—

70/30 Alloy.—Containing not less than 70 per cent. of metallic Copper and not more than a total of 0·75 per cent. of materials other than Copper and Zinc (except that, if so specified, it may contain 1 per cent. of Tin or 1½ to 2 per cent. of Lead).

For Screwed Glands:—

60/40 Alloy.—Containing not less than 60 per cent. of metallic Copper and not more than a total of 0·75 per cent. of materials other than Copper and Zinc (except that, if so specified, it may contain 1 per cent. of Tin or 1½ to 2 per cent. of Lead).

Manufacture.

2. All Condenser Tubes must be straight, clean, smooth and free from longitudinal grooving or other serious defects, and the ends must be cut square and clean.

Dimensions of Condenser Tubes and Tubes for Screwed Glands.

3. The Condenser Tubes shall be of $\frac{5}{8}$ inch or $\frac{3}{4}$ inch external diameter as may be specified, and they shall be not larger than, nor more than 1½ per cent. smaller than, the specified external diameter. The tubes shall be of uniform diameter throughout and the thickness shall be 18 S.W.G. within the usual manufacturing margins.

The external diameter of Tubes used for the manufacture of Screwed Glands shall be as specified within the limits + ·002 inch and − ·003 inch.

Dimensions of Screwed Glands.

4. Screwed Glands shall be of the shape and dimensions shown in Figs. 1 to 3. The Glands shall be chamfered externally at each end.

Weight of Condenser Tubes.

5. For $\frac{5}{8}$ inch external diameter Condenser Tubes the average weight per 100 feet run shall be not more than $32\frac{3}{4}$ lbs. and not less than $31\frac{1}{4}$ lbs. and for $\frac{3}{4}$ inch external diameter Condenser Tubes the average weight per 100 feet run shall be not more than 40 lbs. and not less than 38 lbs., *i.e.*, $2\frac{1}{2}$ per cent. above or below the theoretical weight.

Hydraulic Test for Condenser Tubes.

6. Each Condenser Tube shall be tested internally by water pressure to 600 lbs. per square inch.

Mechanical Tests for Condenser Tubes and Tubes for Screwed Glands.

7. The Manufacturer shall provide at his own expense extra tubes at the rate of 1 per cent. of the number ordered under the Contract and the representative of the Engineer or Purchaser may select and test such tubes in accordance with the following tests to the extent of this percentage. The tests shall be carried out at the Works of the Tube Manufacturer.

For the purpose of selection of the tubes to be tested, the tubes shall be indiscriminately bundled into parcels of 100 and one tube from each parcel shall be selected by the representative of the Engineer or the Purchaser for the following tests:—

Condenser Tubes:—

(*a*) *Examination.*—Each of the selected tubes shall be carefully examined.

(*b*) *Heating and Flattening.*—Each selected tube shall then be cut in halves and the ends of each of the two tubes thus formed must stand being raised to red heat without the tube flying or splitting. When cold these ends must stand flattening close without cracking.

Tubes for Screwed Glands:—

(*c*) The ends of each selected tube must stand being raised to red heat without flying or splitting.

If a selected tube fails in any of the foregoing tests one other tube may be selected from the same parcel and the tests repeated. If this tube fails the parcel of 100 tubes may be rejected.

Inspection.

8. No tube will be accepted which will not stand the specified tests; or which, upon analysis, is found to exceed the limits of impurities specified for the chemical composition and the representative of the Engineer or Purchaser shall be at liberty to reject any material that does not conform to the terms of this Specification.

If called upon the Manufacturer shall furnish a certificate that the Alloy and Tubes supplied conform in all respects to all the above conditions and tests.

Testing Facilities.

9. The Manufacturer shall supply the material required for testing, free of charge, and shall at his own cost furnish and prepare the necessary test pieces and supply labour and appliances for such testing as may be carried out on his premises, in accordance with this Specification. Failing facilities at his own Works for making the prescribed tests, the Manufacturer shall bear the cost of carrying out the tests elsewhere.

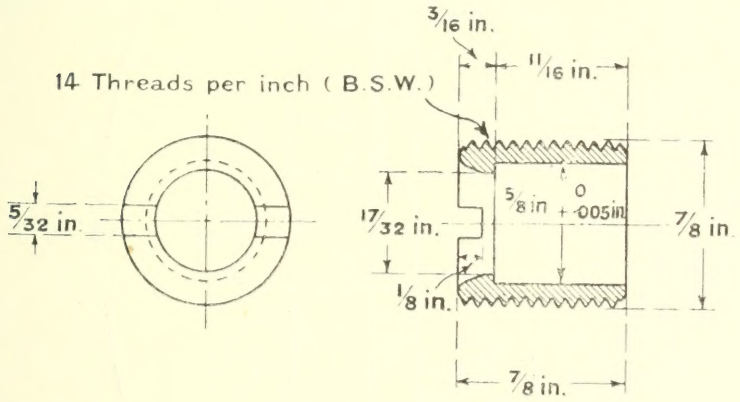

FIG. 1. Screwed Gland for 5/8 inch External Diameter Condenser Tube.

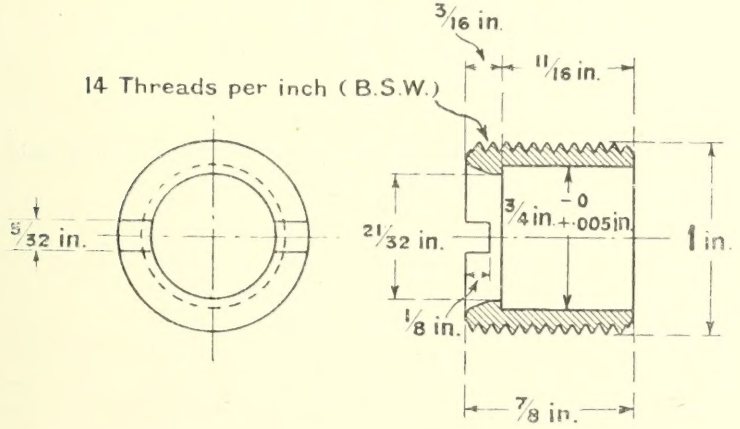

FIG. 2. Screwed Gland for 3/4 inch External Diameter Condenser Tube.

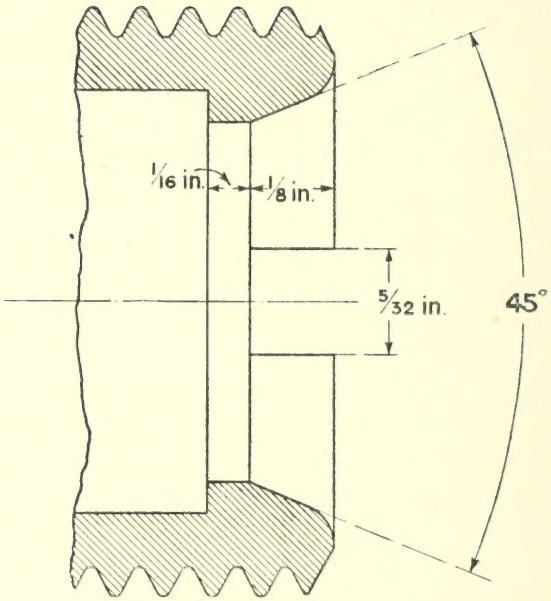

FIG. 3.

Enlarged view of Outer End of Screwed Glands for 5/8 inch and 3/4 inch External Diameter Condenser Tubes.

APPENDIX.

Approximate Metric Equivalents.

The figures in British measures in this Specification are to be regarded as the Standard. The following approximate Metric equivalents are given for convenience of users in countries in which the Metric system has been generally adopted.

Ins.	mm.
·002	0·051
·003	0·076
·005	0·127
1/16	1·59
1/8	3·18
5/32	3·97
3/16	4·76
17/32	13·49
5/8	15·88
21/32	16·67
11/16	17·46
3/4	19·05
7/8	22·23
1	25·40

18 S.W.G. = 1·219 mm.

600 lbs. per sq. in. = 42·18 kgs. per cm.^{2}
31¼ lbs. per 100 ft. = 46·51 kgs. per 100 m.
32¾ lbs. per 100 ft. = 48·74 kgs. per 100 m.
38 lbs. per 100 ft. = 56·55 kgs. per 100 m.
40 lbs. per 100 ft. = 59·53 kgs. per 100 m.

British Engineering Standards Association.

SECTIONAL LIST OF BRITISH STANDARD SPECIFICATIONS.

SHIPBUILDING.

JUNE, 1930.

B.S.S. No.		Net.	Post free.
1-1920.	**Rolled Sections for Structural Purposes.** List of ...	2/-	2/2
6-1924.	**Rolled Steel Sections for Structural Purposes.** Dimensions and Properties of ...	5/-	5/4
13-1910.	**Steel for Shipbuilding.** Structural	2/-	2/2
14-1907.	**Steel for Marine Boilers.** Structural	2/-	2/2
18-1910.	**Tensile Test Pieces.** Forms of...	Gratis.	
23-1909.	**Steel Forgings for Marine Purposes.** Ingot	2/-	2/2
30-1907.	**Steel Castings for Marine Purposes**	2/-	2/2
48-1909.	**Wrought Iron** of Smithing Quality for Shipbuilding (Grade D)	2/-	2/2
62-1913.	**Marine Boiler Stays. Screwing** for	Gratis.	
209-1924.	**Fuels for Heavy-Oil Engines** (Petroleum and Shale Oils)	2/-	2/2
210-1924.	**Pure Mineral Lubricating Oils.** Classification of	2/-	2/2
308-1927.	**Drawing Office Practice.** Standard	2/-	2/2
365-1929.	**Round Strand Galvanized Steel Wire Ropes for Shipping Purposes**	2/-	2/2
3000-1921.	(Formerly No. 145-1921.) **Condenser Tubes and Screwed Glands for Condensers for Marine Purposes**	2/-	2/2
3001-1922.	**Table Glass and Crockery for use on Ships**	2/-	2/2
3005-1922.	**Bollards.** Specification for	2/-	2/2
3006-1924.	**Stud Link Cables (Anchor Cables).** Specification for	2/-	2/2
3009-1928.	**Ships' Boat Davits and Stowage**	2/-	2/2
3011-1929.	**Identification colours for Engine Room Piping**	2/-	2/2
3021-1922.	**Shafting for Marine Purposes**	2/-	2/2
3022-1924.	**Marine Flanges**	2/-	2/2
3023-1926.	**Corrugated Furnaces and Smoke Tubes for Marine Boilers**	2/-	2/2
3024-1926.	**Ships' Side Scuttles and Frames, Type "A"** [*Add.* Sept., 1926]	2/-	2/2

"*Add.*" signifies that an Addendum or Corrigendum is issued with this Specification.

A complete list of the Specifications issued by the Association will be supplied on application.

BRITISH ENGINEERING STANDARDS ASSOCIATION,
PUBLICATIONS DEPT.,
28, VICTORIA STREET, LONDON, S.W.1.

WATERLOW & SONS LIMITED,
49, PARLIAMENT STREET, WESTMINSTER, S.W.1.
(REPRINTED JUNE, 1930.)

BRITISH ENGINEERING STANDARDS ASSOCIATIONS.

The principal objects of the Association are to co-ordinate the efforts of producers and users for the improvement, standardisation and simplification of engineering and industrial materials. To simplify production and distribution. To eliminate the waste of time and material involved in the production of an unnecessary variety of patterns and sizes of articles for one and the same purpose. To set up standards of quality and dimensions, and promote the general adoption of British Standard Specifications throughout the Engineering and allied industries.

In all its endeavours the Association maintains the community of interest of Purchaser and Producer. It does not embark on any work without first ascertaining that there is a consensus of opinion in favour of its being proceeded with, and that it is to fulfil a recognised want.

This national work is carried on largely by means of Grants received from the Government, Professional Institutions and Industrial and Trade Organisations, as well as by sales of its Publications. The amount derived from these sources is, however, not sufficient, and the Association has to look to Industry as a whole for the further funds necessary to enable it to meet the increasing demands made upon its organisation.

The Association is not a profit-making concern, its only expenses being staff salaries, office expenses and printing.